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(54) Grease trap

(57) A grease trap for treating kitchen waste water comprises a rectangular tank divided into two chambers by a transverse baffle 9, one chamber having an inlet 19 provided with a baffle 15 and the other chamber having a downwardly facing outlet pipe 22 and a further baffle 16 adjacent to and extending above the baffle 9. The floor slopes downwards towards baffle 9 in both chambers. The side walls of the upstream chamber 10 have openings near the top of the tank, one serving as a gas vent and the other accommodating a downwardly extending pipe 28 through which the tank contents may periodically be pumped out. The top of the tank is extended upwards by two frames 36, 37, which telescope together so that the upper frame 37 may be concreted in place flush with a floor (not shown). Frame 37 has transverse struts 33 and supports three removable cover plates.

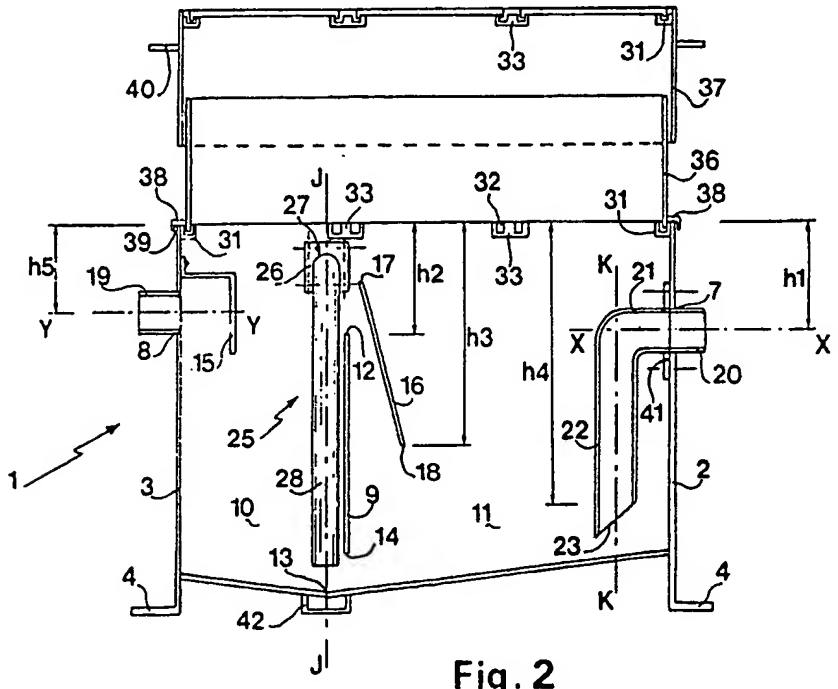

Fig. 2

At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

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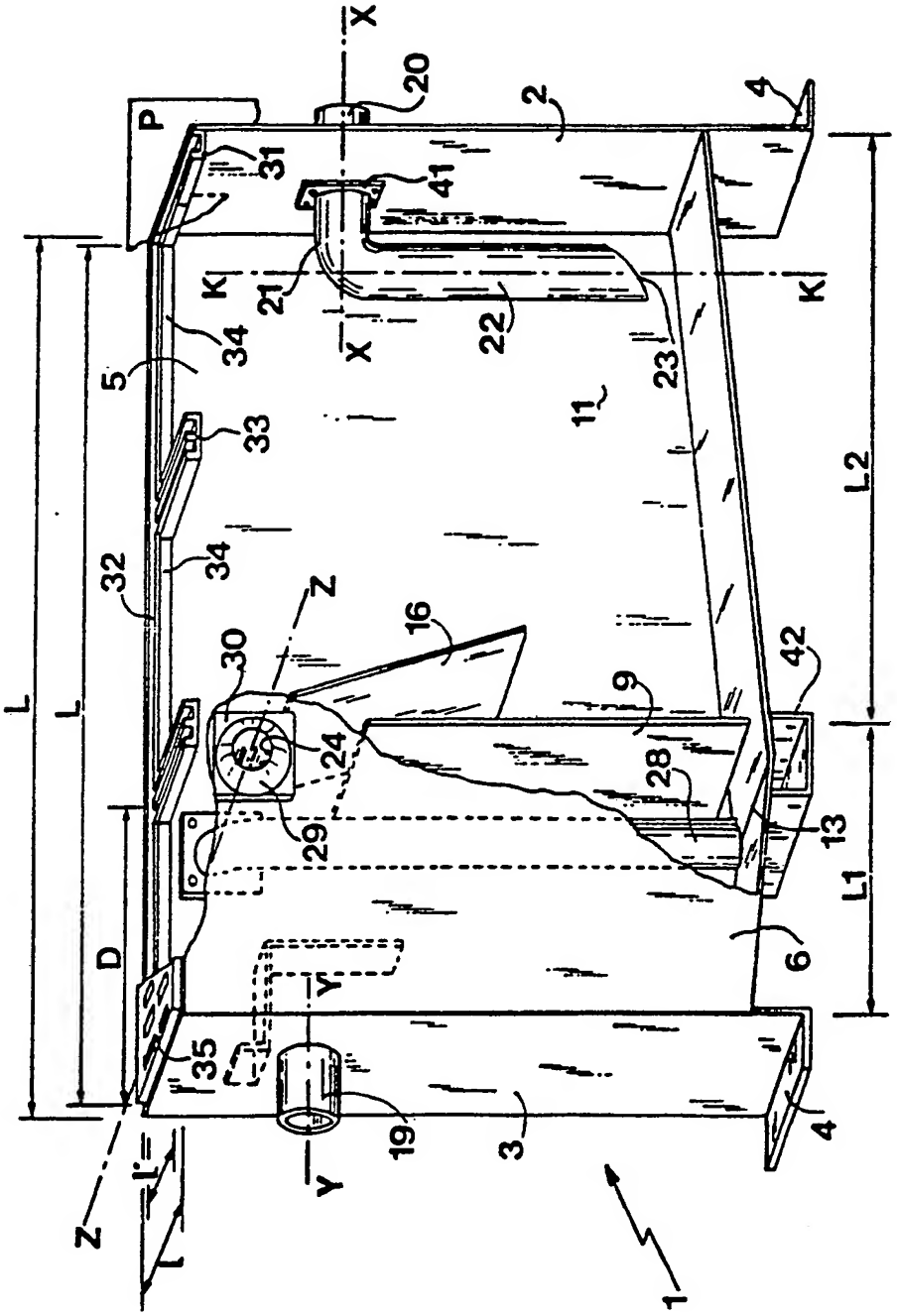

Fig. 1

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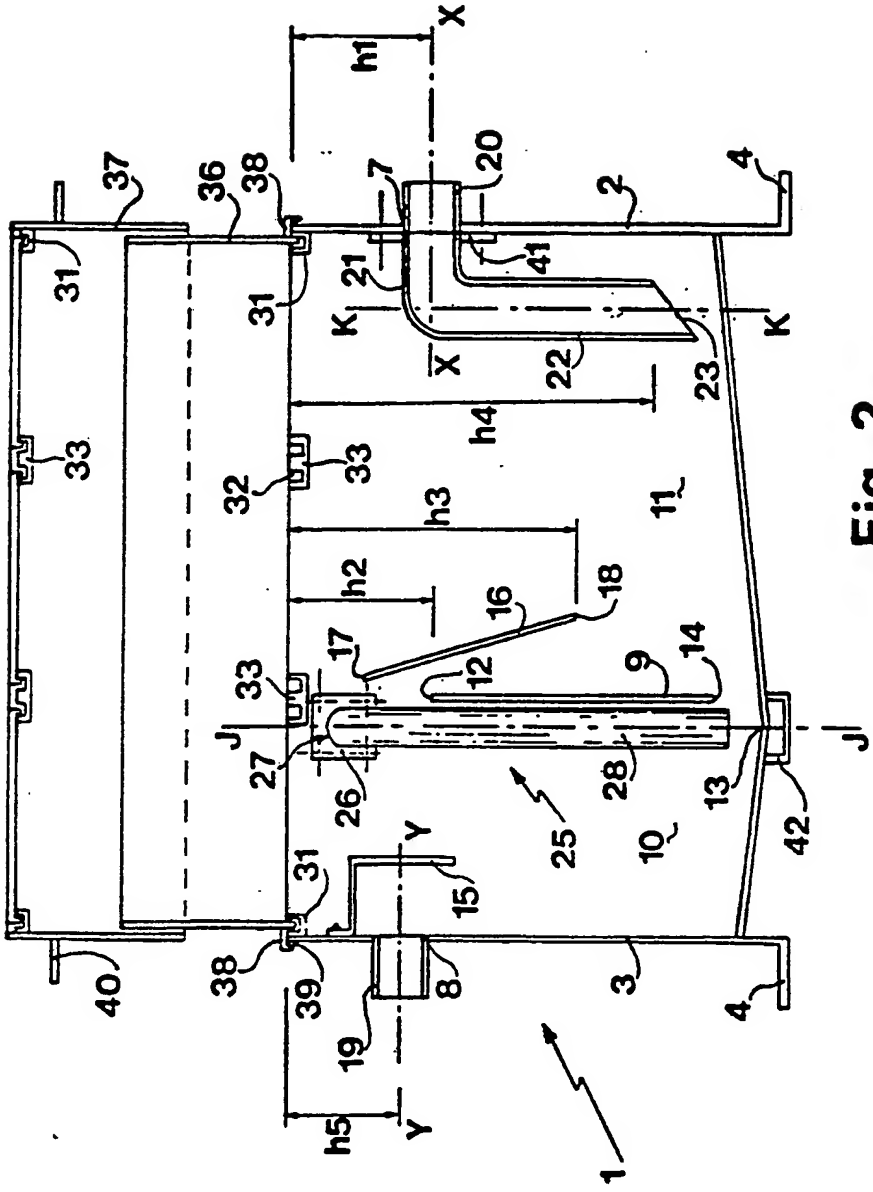

Fig. 2

SEPARATOR FOR FATS

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The present invention relates to a separator apparatus for vegetable or animal fats, which can be adapted to the level of the floor by means of telescopic raising members, intended to remove from the water coming from a collective kitchen, its heavy and light materials, in order to discharge into the drains water which satisfies the sanitary regulations in force.

The sanitary regulations comprise specifications of general order to which all installations discharging waste water must conform.

It is known to use separators for fats constituted by two compartments respectively a washer or decanter allowing the settling of the heavy materials and a separator making it possible to remove from the water fats and light particles.

The waste water coming for example from a restaurant or a collective kitchen enters the washer compartment through an inlet pipe where it is deflected by means of a deflector in order to distribute the effluent. In a first stage, the heavy materials drop to the bottom of the washer. The effluent from which the heavy materials have been removed then passes into the separator compartment by flowing over a partition separating the two compartments, then is deflected towards the bottom by a second deflector. Since this compartment is virtually still, the light materials and the fats rise to the surface and float on the surface of partially clarified water. The discharge of this water into the drains takes place at a lower point of the separator compartment through a pipe extending downwards into the said compartment.

Experience shows that in many cases, the water discharged into the drains still contains a certain number of fatty particles and this is due to the fact that a certain quantity of turbid effluent arriving in the separator compartment is sucked directly towards the discharge pipe before rising to the surface.

The emptying of such separators, when they are saturated, takes place by pumping, by plunging the pipe of an emptying lorry into the compartments of the tank of the separator.

The drawback of this emptying process resides in the necessity of opening the separator, which causes the liberation of gases having an unpleasant smell.

Certain separators can be adapted to the level of the floor by means of fixed raising members.

The drawback of this method resides in the fact that the raising members rest on the walls of the separator and transmit to them all the vibrations and forces undergone by the cover at floor level, thus damaging the said walls.

Another drawback occurs when it is a question of adjusting the cover of the separator to the floor level. Such an operation necessitates the cutting of a raising member on site and is not always carried out perfectly.

The present invention relates to a separator for vegetable or animal fats, constituted by a tank comprising two compartments, respectively a washer and separator, the basis of which slope gently downwards in opposite directions as far as a lower point in the vicinity of a partition acting as the junction between the two compartments, by two deflectors respectively situated in the washer compartment opposite an inlet pipe for turbid effluent and in the separator compartment opposite the upper edge of the partition, by a discharge pipe which extends downwards along the wall of the separator compartment, by an interchangeable ventilation nozzle and emptying pipe as well as by a device for adaptation to the floor level by means of telescopic raising members.

The features and advantages will become apparent from the ensuing description, given solely by way of example and with reference to the accompanying drawings in which:

Figure 1 is a perspective view showing the separator according to the invention partly cut away;

Figure 2 is a sectional view of the separator provided with telescopic raising members.

According to the embodiment illustrated in Figure 1, the separator for fats according to the invention is constituted by a rectangular tank 1, of length L and width l, comprising two transverse vertical walls 2 and 3 provided with a foot 4 and two longitudinal vertical walls 5 and 6.

The transverse wall 2 is provided with an orifice 7, which is circular in the embodiment, on the horizontal axis X-X contained in the longitudinal plane of symmetry P of the tank 1, at a distance h1 from the upper edge of the tank, which distance is substantially equal to a quarter of the total height of the said tank.

In the following description, all the distances or dimensions will be measured from the upper edge of the tank 1.

The transverse wall 3 is also provided with an orifice 8, identical to the orifice 7, on the horizontal axis Y-Y contained in the longitudinal plane of symmetry P of the tank 1, at a distance h5 less than the distance h1 of the orifice 7.

A partition 9, parallel to the transverse vertical walls 2 and 3, divides the separator into two compartments: a washer compartment 10 of length L1 adjacent the orifice 8 situated at the distance h5 and a separator compartment 11 of length L2 adjacent the orifice situated at the distance h1. The length L1 of the washer compartment 10 is less than the length L2 of the separator compartment 11.

In the embodiment illustrated in Figure 1, $L2 = 2 \times L1$ and $L1 = L/3$.

The upper edge 12 of the partition 9 is at a distance h2 greater than h1.

The lower edge 14 of the said partition 9 is at a distance less than that of the bottom of the tank, several centimetres from the latter, thus allowing communication between the two compartments 10 and 11.

A deflector 15 is fixed in the washer compartment 10 opposite the orifice 8 in the transverse wall 3.

A deflector 16 is fixed in the separator compartment 11 opposite and close to the upper edge 12 of the partition 9.

The upper edge 17 of the deflector 16 is above the level of the effluent, in the vicinity of the upper edge of the tank.

The lower edge 18 of the said deflector 16 is at a distance h3 greater than h2, substantially equal to half the total height of the tank 1 in the embodiment.

An inlet pipe 19 for turbid effluent, on the horizontal axis Y-Y, is fixed to the outer face of the transverse wall 3 of the washer compartment 10 of the tank 1 of the separator, in line with the orifice 8.

A pipe 20, on the horizontal axis X-X is fixed to the outer face of the transverse wall 2 of the separator compartment 11, in line with the orifice 7. Its free outlet end is connected to the drains.

A bent pipe 21 for the discharge of the clarified effluent is fixed to the inside of the separator compartment 10, as an extension of the pipe 20, by means of a flange 41. The portion 22, on the vertical axis K-K comprised in the longitudinal plane of symmetry P is immersed in the separator compartment 10. Its free end 23, chamferred against the current, is at a distance h4,

several centimetres from the bottom of the said compartment.

In order to prevent a certain number of fatty particles from being sucked directly towards the discharge pipe 21, the distance h4 of the free end 23 of the pipe 21 is greater than the distance h3 of the lower edge 18 of the deflector 16.

An orifice 24, on the horizontal axis Z-Z perpendicular to the longitudinal plane of symmetry P, is provided in each longitudinal vertical wall 5, 6, in the vicinity of its upper edge, in the washer compartment 10.

A bent emptying pipe 25 is fixed to one of the longitudinal walls 5, 6 of the tank 1 of the separator, in the washer compartment, by means of a flange 26. The horizontal portion 27 (not shown) of the pipe 25, on the axis Z-Z, passes through the orifice 24 on the vertical portion 28, on the vertical axis J-J, is immersed in the washer compartment as far as a lower point several centimetres from the bottom of the tank 1.

The lateral position of the orifice 24 is such that when the emptying pipe 25 is fixed therein, the latter is contiguous to the partition 9.

A ventilation nozzle 29 is fixed on the other longitudinal wall of the tank 1 by means of a flange 30 identical to the flange 26 and projects outside the tank. This ventilation nozzle 29 facilitates the connection of the tank 1 of the separator to the open air.

In the embodiment illustrated, the emptying pipe 25 is fixed to the longitudinal wall 5 and the ventilation nozzle 29 is fixed to the longitudinal wall 6 of the tank of the separator.

The outlet end of the emptying pipe 25 projecting from the tank 1 may for example be provided with a mouthpiece of the dry column type (not shown) allowing the attachment of the flexible pipe of an emptying lorry.

The emptying pipe 25 and the ventilation nozzle 29 are interchangeable.

Thus, at the time of installation of the separator according to the invention, depending on the position in which it is installed, which position is dictated by the direction of travel of the effluent, the emptying pipe 25 will be fixed to the most accessible longitudinal wall. The ventilation nozzle 29 will be fixed to the other wall.

The base of each compartment 10 and 11 of the tank 1 of the separator according to the invention slopes gently in opposite directions with respect to each other in order to join as a V in line with the emptying pipe 25.

An edge 13, perpendicular to the plane P, at the base of the V formed by the bottom of the compartments 10 and 11, thus forms a low point in line with the said emptying pipe 25.

A central foot 42 is fixed underneath the tank 1, in line with the edge 13.

The upper end of each vertical wall 2, 3, 5 and 6 of the tank 1 of the separator is provided, on its inner face, with a U-shaped sectional member 31, thus forming a continuous rectangular groove 32, of length L' and width l', over the entire periphery of the tank 1 of the separator.

Double sectional members 33, parallel to the transverse walls 2 and 3, are welded between the longitudinal walls 5 and 6 of the tank 1 of the separator.

In the embodiment, two double sectional members 33 are welded between the longitudinal walls 5 and 6 of the separator. Each sectional member is separated from the adjacent sectional member by a distance $D = L/3$.

The groove 32 is connected to the grooves formed by the double sectional members 33 thus forming three continuous frames 34.

A hydraulic joint (not shown) is introduced into the frames 34.

The separator is closed by means of covers 35 of the manhole type supported on the frames 34.

The device consisting of telescopic raising members is constituted by two sliding frames 36 and 37.

The frame 36 is a rectangular frame of length L' and width l' identical to the length and width of the groove 32 of the tank 1 of the separator.

An angle iron 38 is welded to the lower end of each wall of the frame 36 on its outer face, thus forming a continuous groove 39 in the form of an inverted U, over the entire outer periphery of the said frame. The continuous groove 39 is rectangular and of length L, of width l and has a cross-section greater than the thickness of the walls of the tank 1.

The frame 37 is a rectangular frame the dimensions of which are identical to those of the tank 1 of the separator. The upper end of its walls are provided with the same angle irons 31 and the same double sectional members 33 with which the walls of the tank 1 are provided.

A horizontal flange 40 is welded to the outer face of the walls of the frame 37 in the vicinity of its upper end, thus forming a load-distribution frame on the outer periphery of the frame 37.

The raising of the telescopic raising members is simple.

The angle iron 38 of the frame 36 rests on the upper end of the vertical walls 2, 3, 5 and 6 of the tank 1 of the separator, thus preventing any introduction of earth into the separator.

The frame 37 slides outside the frame 36 thus allowing an adjustment in height of the covers 35 closing off the arrangement.

The frame 37 sliding outside the frame 36 also prevents any introduction of earth into the separator.

Once the adjustment has been made, the load-distribution frame is sealed in a concrete bed.

The advantages offered by the invention are as follows:

- the emptying pipe and the ventilation nozzle are interchangeable thus providing great installation flexibility and a reduction of storage costs;

- any risk of error in the wording for the control mechanism of the separator or of the delivery is eliminated, owing to the interchangeability of the emptying pipe and the ventilation nozzle;

- handling of the cover is made easier, since it is constituted by a series of manhole-type covers, which are lighter than a one-piece cover;

- it is possible to open only one single compartment of the separator;

- emptying of the separator may be carried out without requiring opening of the latter;

- the raising members for the frost protection of the separator are vertically adjustable;

- vibrations coming from the floor are not transmitted to the walls of the separator;

- the tank-cover connection or raising member-cover connection is achieved in an air-tight manner;

- the presence of a ventilation nozzle connected to the open air prevents the spread of any gases having an unpleasant smell;

- at the time of transportation of the separator, the bulk may be reduced to the width of the tank by dismantling the emptying pipe and the ventilation nozzle;

- the shape of the base of the separator allows handling of the tank by means of a fork-lift truck without special chocking

- the possible removal of all the parts fixed by means of flanges facilitates any intervention in the tank;

- the presence of a load-distribution frame on the raising members allows the use of light or heavy covers.

CLAIMS

1. Separator for vegetable or animal fats constituted by a tank comprising two compartments respectively a washer and separator, the bases of which slope gently downwards in opposite directions to a low point in the vicinity of a partition acting as a junction between the two compartments, by two deflectors situated respectively in the washer compartment opposite an inlet conduit for turbid effluent and in the separator compartment opposite the upper edge of the partition and by a discharge conduit which extends downwards along the wall of the separator compartment, wherein the distance (h4) of the free end of the discharge conduit from the upper edge of the tank is greater than the distance (h3) of the lower edge of the deflector in the separator compartment from said upper edge of the tank.

2. Separator according to claim 1, wherein an orifice, on the horizontal axis Z-Z perpendicular to the longitudinal plane of symmetry (P) is provided in the washer compartment in each longitudinal vertical wall, in the vicinity of the upper edge of the tank.

3. Separator according to Claim 1 or 2, wherein a bent emptying pipe is fixed to one of the longitudinal walls of the tank in the washer compartment by means of a first flange.

4. Separator according to Claim 3 wherein a ventilation nozzle is fixed to the other longitudinal wall of the tank by means of a second flange identical to the first flange.

5. Separator according to Claim 4 wherein the emptying pipe and the ventilation nozzle are interchangable.

6. Separator according to Claim 1, wherein each

vertical wall of the tank of the separator is provided on its inner face with a U-shaped sectional member, thus forming a rectangular groove on the periphery of the said tank.

7. Separator according to Claim 1, wherein double sectional members are welded between the longitudinal walls of the separator.

8. Separator according to Claims 6 or 7, wherein the separator is closed by means of covers supported on the frames formed by the sectional members.

9. Separator according to Claim 1, wherein there is provided a device consisting of raising members and constituted by a rectangular frame, whereof the lower end is provided with angle irons forming a groove of inverted U-shape, which rests on the upper end of the walls of the separator.

10. Separator according to Claims 8 or 9 wherein the rectangular frame is mounted to slide on a further rectangular frame whereof the dimensions are identical to those of the tank of the separator and comprising the same sectional members as those with which the walls of the tank of the separator are provided and a load-distribution frame on its periphery.